

Figure 1

Tomato Leaf DHS cDNA sequence

MyID 1 NT
MyID 2 AA

CGCAGAACTCGCGGCGGCAGTCTTGTTCGTACATAATCTTGGTCTGCAATAATGGGAGAAGCTCTGAAGTACAGTATCATGGAC
M G E A L K Y S I M D
TCAGTAAGATCGGTAGTTTTCAAGAATCCGAAAATCTAGAAGGTTCTTGCACATAAATCGAGGGCTACGACTTCAATAAAGGCGT
S V R S V V F K E S E N L E G S C T K I E G Y D F N K G V
TAACTATGCTGAGCTGATCAAGTCCATGGTTTCCACTGGTTTCCAAGCATCTAATCTTGGTGACGCCATTGCAATTGTTAATCAAA
N Y A E L I K S M V S T G F Q A S N L G D A I A I V N Q
TGCTAGATTGGAGGCTTTCACATGAGCTGCCACGGAGGATTGCAGTGAAGAAGAAAGAGATGTTGCATACAGAGAGTCCGGTAACC
M L D W R L S H E L P T E D C S E E E R D V A Y R E S V T
TGCAAAATCTTCTTGGGGTTCACTTCAAACCTTGTTCCTTCTGGTGTAGAGACACTGTCCGCTACCTTGTTCAGCACCGGATGGT
C K I F L G F T S N L V S S G V R D T V R Y L V Q H R M V
TGATGTTGTGGTTACTACAGCTGGTGGTATTGAAGAGGATCTCATAAAGTGCCTCGCACCAACCTACAAGGGGGACTTCTCTTTAC
D V V V T T A G G I E E D L I K C L A P T Y K G D F S L
CTGGAGCTTCTCTACGATCGAAAGGATTGAACCGTATTGGTAACCTTATTGGTTCCTAATGACAACTACTGCAAAATTTGAGAATTGG
P G A S L R S K G L N R I G N L L V P N D N Y C K F E N W
ATCATCCCAGTTTTTTGACCAAAATGTATGAGGAGCAGATTAATGAGAAGGTTCTATGGACACCATCTAAAGTCATTGCTCGTCTGGG
I I P V F D Q M Y E E Q I N E K V L W T P S K V I A R L G
TAAAGAAATTAATGATGAAACCTCATACTTGTATTGGGCTTACAAGAACCGGATTCTGTCTTCTGTCTCTGGCTTGACGGATGGAT
K E I N D E T S Y L Y W A Y K N R I P V F C P G L T D G
CACTTGGTGACATGCTATACTTCCATTCTTTCAAAAAGGGTGATCCAGATAATCCAGATCTTAATCCTGGTCTAGTCATAGACATT
S L G D M L Y F H S F K K G D P D N P D L N P G L V I D I
GTAGGAGATATTAGGGCCATGAATGGTGAAGCTGTCCATGCTGGTTTGAGGAAGACAGGAATGATTATACTGGGTGGAGGGCTGCC
V G D I R A M N G E A V H A G L R K T G M I I L G G G L P
TAAGCACCATGTTTGCAATGCCAATATGATGCGCAATGGTGCAGATTTTGCCGCTTTCATTAACACCGCACAAAGAGTTTGATGGTA
K H H V C N A N M M R N G A D F A V F I N T A Q E F D G
GTGACTCTGGTGCCCGTCTCTGATGAAGCTGTATCATGGGGAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCA
S D S G A R P D E A V S W G K I R G G A K T V K V H C D A
ACCATTGCAATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTTCTCCAGATAAGGTGCCAAGTTTGAACATT
T I A F P I L V A E T F A A K S K E F S Q I R C Q V
GAGGAAGCTGTCCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCAACTTGCTAGTGTGCAGCACCATTATTCTGCAAAA
CTGACTAGAGAGCAGGGTATATTCCCTCTACCCCGAGTTAGACGACATCCTGTATGGTTCAAATTAATTATTTTCTCCCTTTCACA
CCATGTTATTTAGTTCCTTCTCCTCTTCGAAAGTGAAGAGCTTAGATGTTTCATAGGTTTTGAATTATGTTGGAGGTTGGTGATACT
GACTAGTCTCTTACCATATAGATAATGTATCCTTGTACTATGAGATTTTGGGTGTGTTTGATACCAAGGAAAAATGTTTATTTGG
AAAACAATTGGATTTTTAATTTATTTTCTTGTTTAAAAA

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Arabidopsis DeoxyHypusine Synthase (DHS) Predicted Sequence

Figure 2A

seq 5 = NT

GAAC TCCCAA AACCTCTACTACTACTTTTCAGATCCAAGGAAATCAATTTTGTCAATTCGAGCAACATGG
M
AGGATGATCGTGTCTTCTCTTCGGTTCCTCAACAGTCTTCAAGAATCCGAATCATTGGAAGGAAAGTGT
E D D R V F S S V H S T V F K E S E S L E G K C
GATAAAATCGAAGGATACGATTTCAATCAAGGAGTAGATTACCCAAAGCTTATGCGATCCATGCTCACCAC
D K I E G Y D F N Q G V D Y P K L M R S M L T T
CGGATTTCAAGCCTCGAATCTCGGCGAAGCTATTGATGTCGTCAATCAAATGGTTCGTTTCTCGAATTCAT
G F Q A S N L G E A I D V V N Q M
CAAAAATAAAATTCCTTCTTTTGTCTTCTTGTGTTTGGGTGAATTAGTAATGACAAAGAGTTTGAATT
F E F
TGTATTGAAGCTAGATTGGAGACTGGCTGATGAACTACAGTAGCTGAAGACTGTAGTGAAGAGGAGAAGA
V L K L D W R L A D E T T V A E D C S E E E K
ATCCATCGTCTTAGAGAGTCTGTCAAGTGTAAATCTTTCTAGGTTTCACTTCAAATCTTGTTCATCTGGT
N P S F R E S V K C K I F L G F T S N L V S S G
GTTAGAGATACTATTCTGTTATCTTGTTCAGCATCATATGGTTTGTGATTTTTGCTTTATCACCTGCTTTT
V R D T I R Y L V Q H H M
TTATAGATGTTAAAATTTTCGAGCTTTAGTTTGTGATTTCAATGGTTTTTCTGCAGGTTGATGTTATAGTCA
V D V I V
CGACAAC TGGTGGTGTGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTA
T T T G G V E E D L I K C L A P T F K G D F S L
CCTGGAGCTTATTTAAGGTCAAAGGATTGAACCGAATTGGGAATTTGCTGGTTCTTAATGATAACTACTG
P G A Y L R S K G L N R I G N L L V P N D N Y C
CAAGTTTGAGGATTGGATCATTTCCATCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGGTATTGCTTT
K F E D W I I P I F D E M L K E Q K E E
ATCTTTCCTTTTATATGATTTGAGATGATTCTGTTTGTGCGTCACTAGTGGAGATAGATTTTGATTCCTC
TCTTGCATCATTGACTTCGTTGGTGAATCCTTCTTCTGCTGTTTTCTTGTAGATGTGTTGTGGACTC
N V L W T
CTTCTAAACTGTTAGCACGGCTGGGAAAAGAAATCAACAATGAGAGTTTCATACCTTTATTGGGCATACAAG
P S K L L A R L G K E I N N E S S Y L Y W A Y K
GTATCCAAAATTTTAACTTTTATGTTTAAATCATCCTGTGAGGAAC TCGGGGATTTAAATTTTCCGCT
TCTTGTGGTGTGTTAGATGAATATTCCAGTATTCTGCCCAGGGTTAACAGATGGCTCTCTTGGGGATATG
M N I P V F C P G L T D G S L G D M
CTGTATTTTCACTCTTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGGTACTTCTTTTACTCAATA
L Y F H S F R T S G L I I D V V Q
AGTCAGTGTGATAAATATTCCTGCTACATCTAGTGCAGGAATATTGTAAGTGTAGTGCATTGTAGCTTTT
CCAATTCAGCAACGGACTTTACTGTAAGTTGATATCTAAAGGTTCAAACGGGAGCTAGGAGAATAGCATAG
GGGCATTCTGATTTAGGTTTGGGGCACTGGGTAAAGAGTTAGAGAATAATAATCTTGTAGTTGTTTATCA
AACTCTTTGATGGTTAGTCTCTTGGTAATTTGAATTTTATCACAGTGTATTATGGTCTTTGAACCAAGTTAAT
GTTTTATGAACAGATATCAGAGCTATGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGAT
D I R A M N G E A V H A N P K K T G M I
AATCCTTGGAGGGGGCTTGCCAAAGCACCACATATGTAATGCCAATATGATGCGCAATGGTGCAGATTACG
I L G G G L P K H H I C N A N M M R N G A D Y
CTGTATTTATAAACACCGGGCAAGAATTTGATGGGAGCGACTCGGGTGCACGCCCTGATGAAGCCGTGTCT
A V F I N T G Q E F D G S D S G A R P D E A V S
TGGGGTAAATTTAGGGTTCTGCTAAAACCGTTAAGGTCGCTTTTAAATTTCTTCACATCCTAATTTATA
W G K I R G S A K T V K V C F L I S S H P N L Y
TCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATCTTTCGAGGTATACTGTGATGCTACCATA
L T Q W F
GCCTTCCCATTTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACCAAACCTGTGAGTCTAAGACTTAAGA
ACTGACTGGTCTGTTTGGCCATGGATTCTTAAAGATCGTTGCTTTTTGATTTTACACTGGAGTGACCATAT
AACACTCCACATTGATGTGGCTGTGACGCGAATGTCTTCTTGCGAATGTACTTTAGTTTCTCTCAACCT
AAAATGATTTGCAGATTGTGTTTTCGTTTAAACACAAGAGTCTTGTAGTCAATAATCCTTTGCCTTATAA
AATTATTCAGTTCCAACAACACATTTGTGATTTCTGTGACAAGTCTCCCGTTGCCATATGTTCACTTCTCTGCG

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Figure 2B

MEDDRVFSVHSTVFKESSESLGKCDKIEGYDFNQGVDPKLMRSMLTTFQASNLGEAIDVVNQMFVFLKLDWRLADETTV
AEDCSEEEKNPSFRESVKCKIFLGFTSNLVSSGVRDTIRYLVQHMDVIVTTTGGVEEDLIKCLAPTFKGDFSLPGAYLRSK
GLNRIGNLLVPNDNYCKFEDWIIPIFDEMLKEQKEENVLWTPSKLLARLGKEINNESSYLYWAYKMNI PVFCPGLTDGSLGDM
LYFHSFRTSGLIIDVVQDIRAMNGEAVHANPKKTGMIILGGGLPKHHICNANMMRNGADYAVFINTGQEFDGSDSGARPDEAV
SWGKIRGSAKTVKVCFLISSHPNLYLTQWF

Figure 2C

GGTGGTGTGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTACCTGGAGCTTATTTAAG
GTCAAAGGGATTGAACCGAATTGGAATTTGCTGGTTCCCTAATGATAACTACTGCAAGTTTGAGGATTGGATCATTCCTCA
TCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGAATGTGTTGTGGACTCCTTCTAAACTGTTAGCACGGCTGGGAAAA
GAAATCAACAATGAGAGTTTCATACCTTTATTGGGCATACAAGATGAATATTCCAGTATTCTGCCCAGGGTTAACAGATGG
CTCTCTTAGGGATATGCTGTATTTTCACTCTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGATATCAGAGCTA
TGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGATAATCCTTGGAGGGGGCTTGCCAAAGCACCACATA
TGTAATGCCAATATGATGCGCAATGGTGCAGATTACGCTGTATTTATAAACACCGGGCAAGAAATTTGATGGGAGCGACTC
GGGTGCACGCCCTGATGAAGC

Figure 2D

GGVEEDLIKCLAPTFKGDFSLPGAYLRSKGLNRIGNLLVPNDNYCKFEDWIIPIFDEMLKEQKEENVLWTPSKLLARLGKEIN
NESSYLYWAYKMNI PVFCPGLTDGSLRDMLYFHSFRTSGLIIDVVQDIRAMNGEAVHANPKKTGMIILGGGLPKHHICNANMM
RNGADYAVFINTGQEFDGSDSGARPDE

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Figure 3

Multiple DHS Sequence Alignments of Human, Arabidopsis, Tomato, Yeast, Neurospora(Fungi), and Methanococcus(Archaeobacteria)

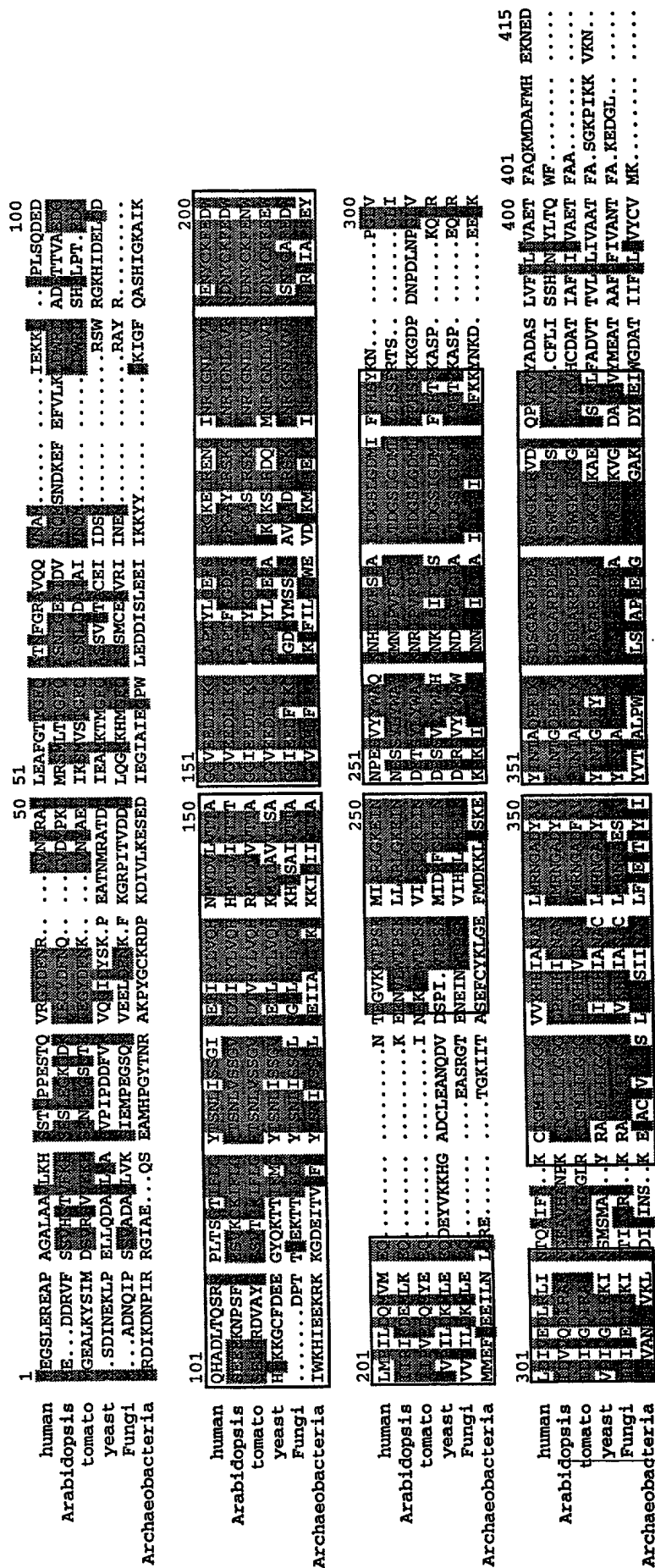


Figure 4

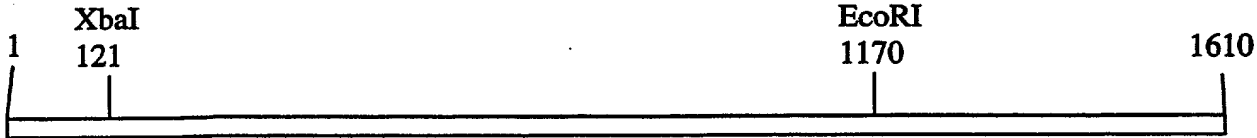


Figure 5

Southern Analysis of DHS

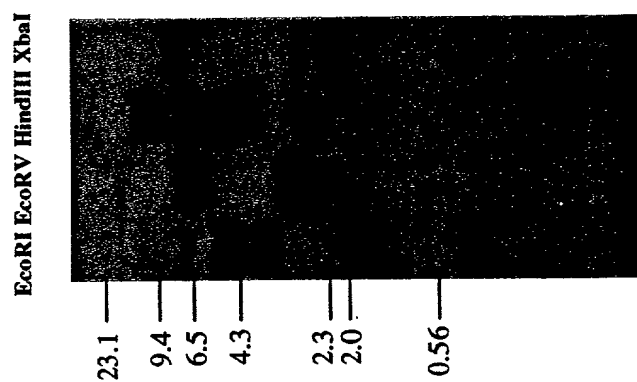


Figure 6

Northern Analysis of DHS on Tomato Flowers

**Blossom
and
Bud Senescence**



RNA



Northern

Tomato Fruit

Northern Blot

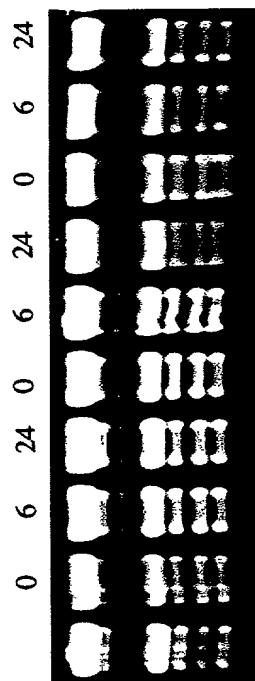
Before treatment	Treated with water for 6 hr	Treated with sorbitol for 6 hr
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Figure 9

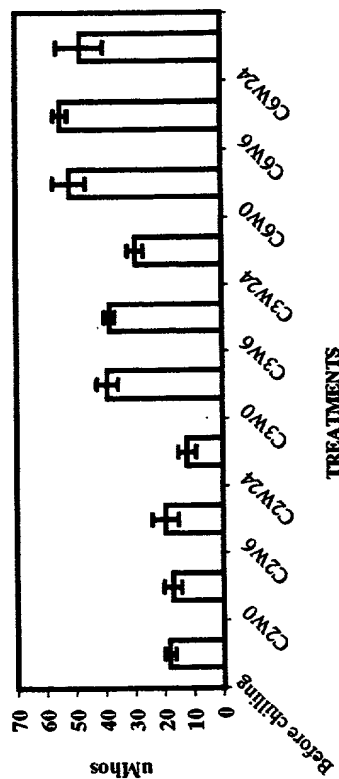
Northern Analysis of DHS Tomato Leaf Chilling Effects

Chilling 3 days,
rewarm 1 day,
Before Chilling 2 days
Chilling rewarming (hr) 0 6 24 0 6 24
Chilling 6 days
rewarming (hr) 0 6 24



RNA

Northern



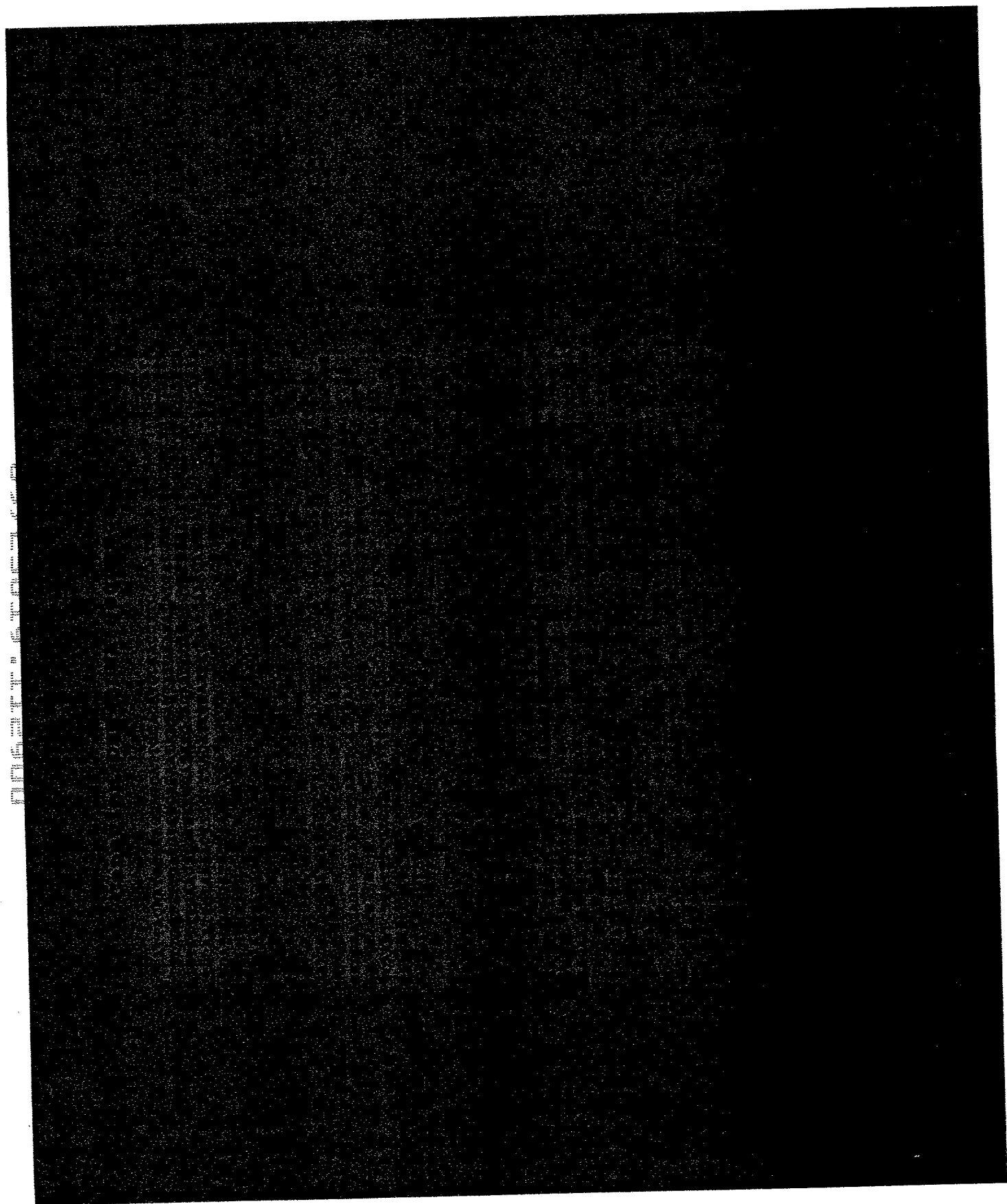


Figure 10

Tomato eif5A

Figure 13

AAAGAAATCCTAGAGAGAGAAAGGGAATCCTAGAGAGAGAAAGCAATGTCGGACGAAGAACAC
M S D E E H
CATTTGAGTCAAGGCAGATGCTGGTGCCTCAAAAACCTTCCACAGCAAGCTGGAACC
H F E S K A D A G A S K T F P Q Q A G T
ATCCGTAAGAAATGGTTACATCGTTATCAAGGCCGCTCCCTGCAAGGTTGTTGAGGTCTCC
I R K N G Y I V I K G R P C K V V E V S
ACTTCAAAAACCTGGAACACACGGACATGCTAAATGTCACTTTGTGGCAATTGACATTTTC
T S K T G K H G H A K C H F V A I D I F
AATGGAAGAAACTGGAAGATATCGTTCCGTCCTCCACAAATTGTGATGTGCCACATGTT
N G K K L E D I V P S S H N C D V P H V
AACCGTACCGACTATCAGCTGATTGATATCTCTGAAGATGGTTTGTCTCACTTCTTACT
N R T D Y Q L I D I S E D G F V S L L T
GAAAGTGAAACACCAAGGATGACCTCAGGCTTCCACCGATGAAATCTGCTGAAGCAG
E S G N T K D D L R L P T D E N L L K Q
GTTAAAGATGGGTTCCAGGAAGGAAAGGATCTTGTGGTGTCTGTATGTCTGCGATGGGC
V K D G F Q E G K D L V V S V M S A M G
GAAGAGCAGATTAAACGCCGTTAAGGATGTTGGTACCAAGAATTAGTTATGTCATGCGCAGC
E E Q I N A V K D V G T K N
ATAATCACTGCCAAAGCTTTAAGACATTATCATATCCTAATGTGGTACTTTGATATCACT
AGATTATAAACTGTGTTATTGCACTGTTCAAAACAAAGAAAGAAACTGCTGTTATGG
CTAGAGAAAAGTATTGGCTTTGAGCTTTTGACAGCACAGTTGAACTATGTGAAAATCTTAC
TTTTTTTTTTTGGGTAAATACTGCTCGTTTAATGTTTTCAAAAAATAAAAAA

764 bps, not including Poly(A) tail; 160 amino acids

Figure 13

790 bps, 160 amino acids

CTCTTTTACATCAATCGAAAAAAATTAGGGTTCCTTATTTTAGAGTGAGA
GGCGAAAAATCGAAACGATGTCGGACGACGATCACCATTTTCGAGTCATCGG
M S D D D H H F E S S A
CCGACGCCGGAGCATCCAAGACTTACCCTCAACAAGCTGGTACAATCCGC
D A G A S K T Y P Q Q A G T I R
AAGACGGTCACATCGTCATCAAAAAATGCCCTGCAAGGtGGTTGAGGT
K S G H I V I K N R P C K V V E V
TTTACCTCCAAGACTGGCAAGCACGGTCATGCCAAATGTCACCTTTGTTG
S T S K T G K H G H A K C H F V A
CCATGACATTTTCAACGGCAAGAAAGCTGGAAGATATTGTCCCCCTCATCC
I D I F N G K K L E D I V P S S
CACAATTGTGATGTTCCACATGTCAACCGTGTGCGACTACCAGCTGCTTGA
H N C D V P H V N R V D Y Q L L D
TATCACTGAAGATGGCTTTGTTAGTCTGCTGACTGACAGTGGTGACACCA
I T E D G F V S L L T D S G D T K
AGGATGATCTGAAGCTTCCTGCTGATGAGGCCCTTGTGAAGCAGATGAAG
D D L K L P A D E A L V K Q M K
GAGGGATTTGAGCGGGGAAAGACTTGATTCTGTCAGTCACTGTGTGCAAT
E G F E A G K D L I L S V M C A M
GGGAGAAGACGAGATCTGGCCCGTCAAGGACGTTAGTGGTGCGCAAGTAGA
G E E Q I C A V K D V S G G K
AGCTTTTGTGAATCCAATACCTACCGGTGCGAGTTGAAGCAATAGTAATC
TCGAGAACAATCTGAACCTTATATGTTGAATTGATGGTCTTAGTTGTTGTT
TTGGAAATCTCTTTTGCAATTAAAGTTGTACCAAAATCAATGATGTAATGTC
TTTGAATTTGTTTATTTTGTGTTTGTGTTTGTGCTGtGATTGCATTATGCA
TTGTTATGAGTTATGACCTGTTATAACACAAAGGTTTGTGTAATAAAAAA
AAAAA

Northern Analysis of WT AT DHS and F5A

Aging Leaves

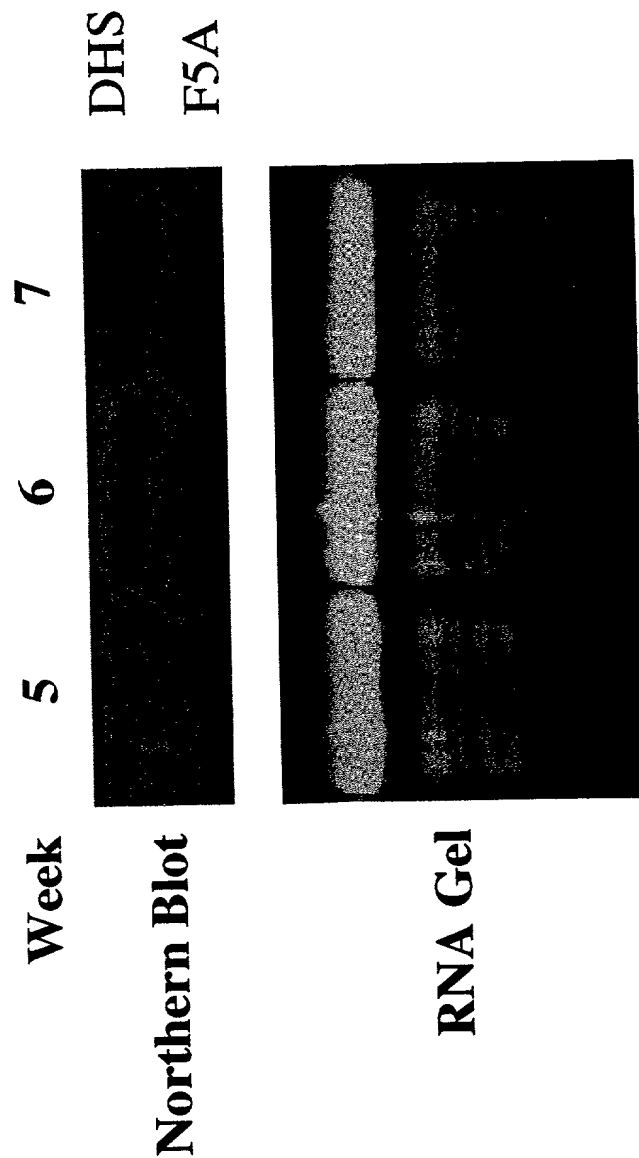


Figure 16

Northern Analysis of Ripening Hormone Tumor

PK-19-19

PK-19-19

PK-19-19

PK-19-19

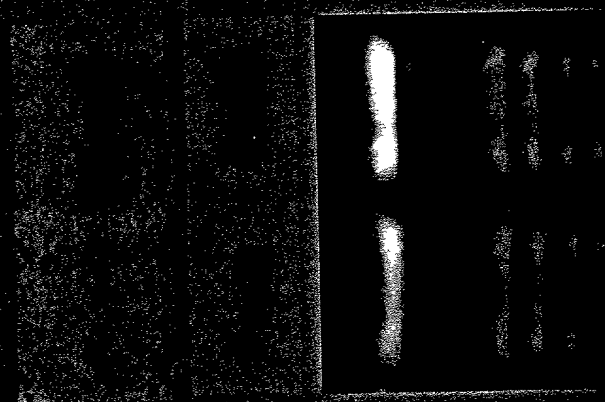


Figure 17

Northern Analysis of sorbitol reductase (SODR)

leaves

C S



18S

28S

RNA

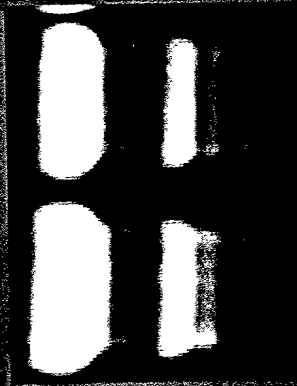
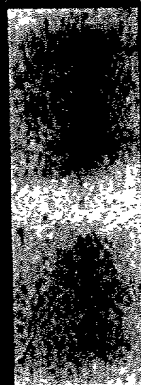
Figure 18

Northern Analysis of Tomato Flowers

Open &

Flower senescing

Buds Flowers



DEHS

TEA

RNA

Figure 19

Northern Analysis of chill-injured tomato leaves



Figure 20

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3.1 Weeks

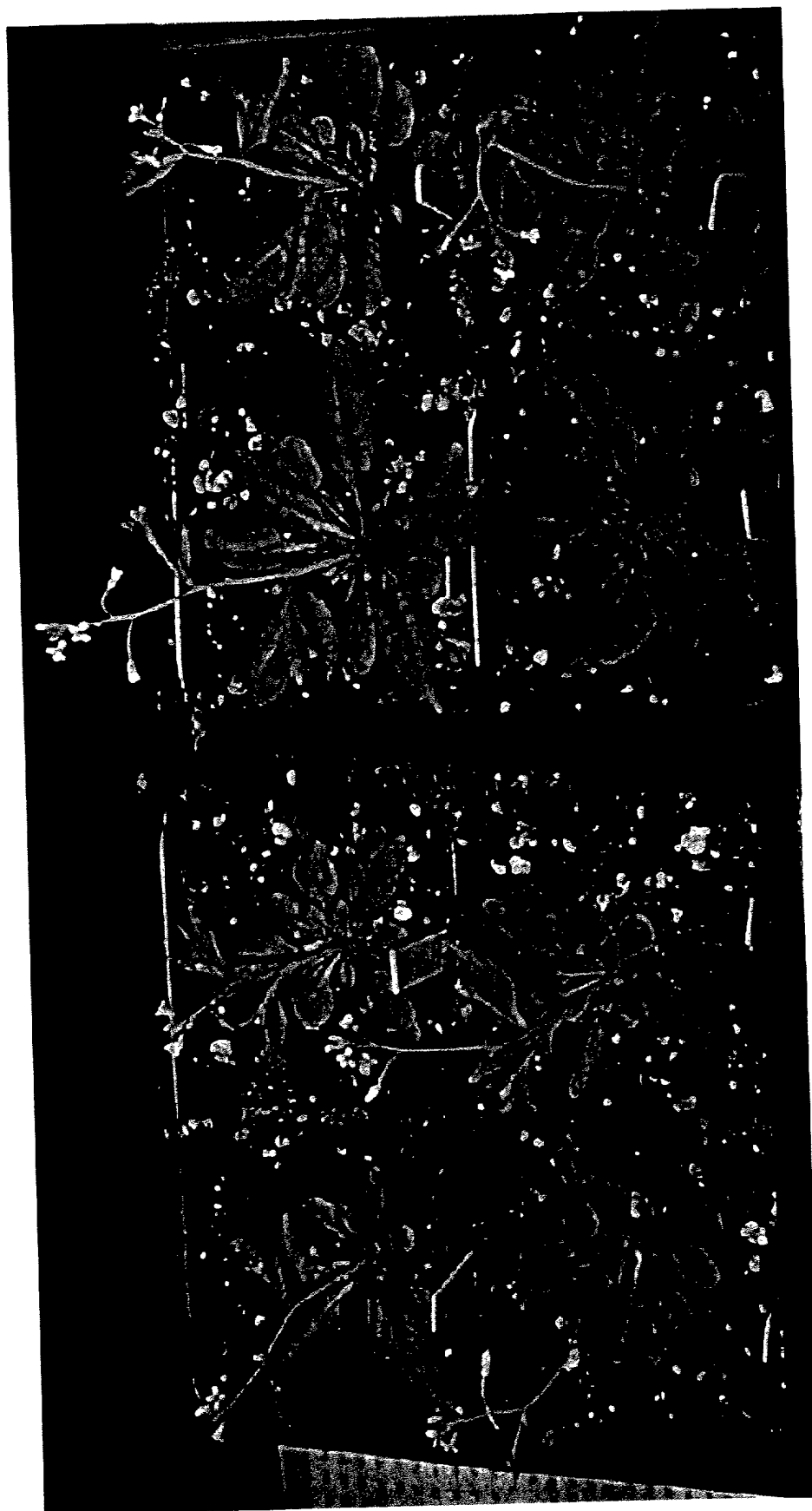


α - 3'DHS #3

Wild-Type

Figure 21

4.6 Weeks

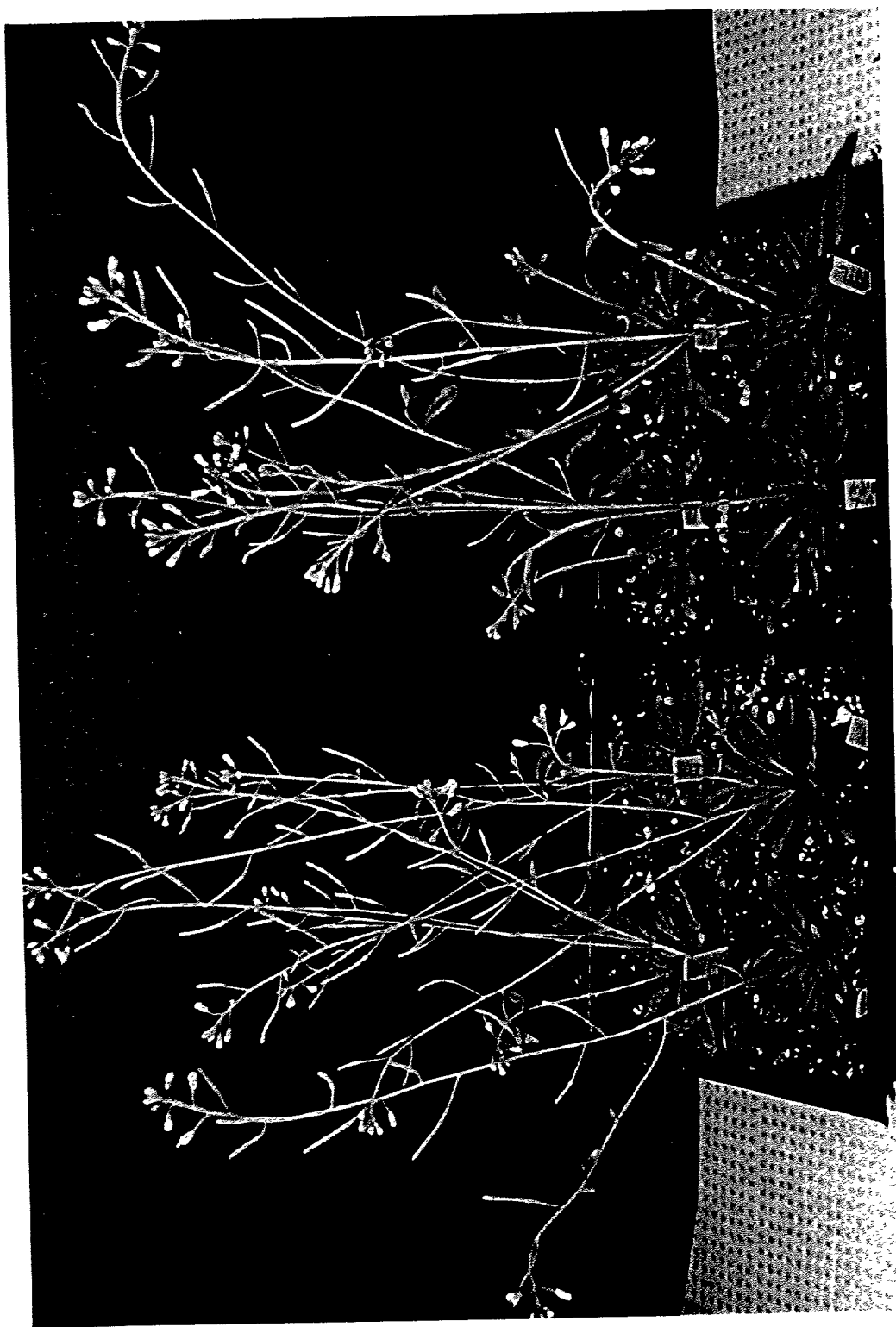


α - 3'DHS #3

Wild-Type

Figure 22

5.6 Weeks

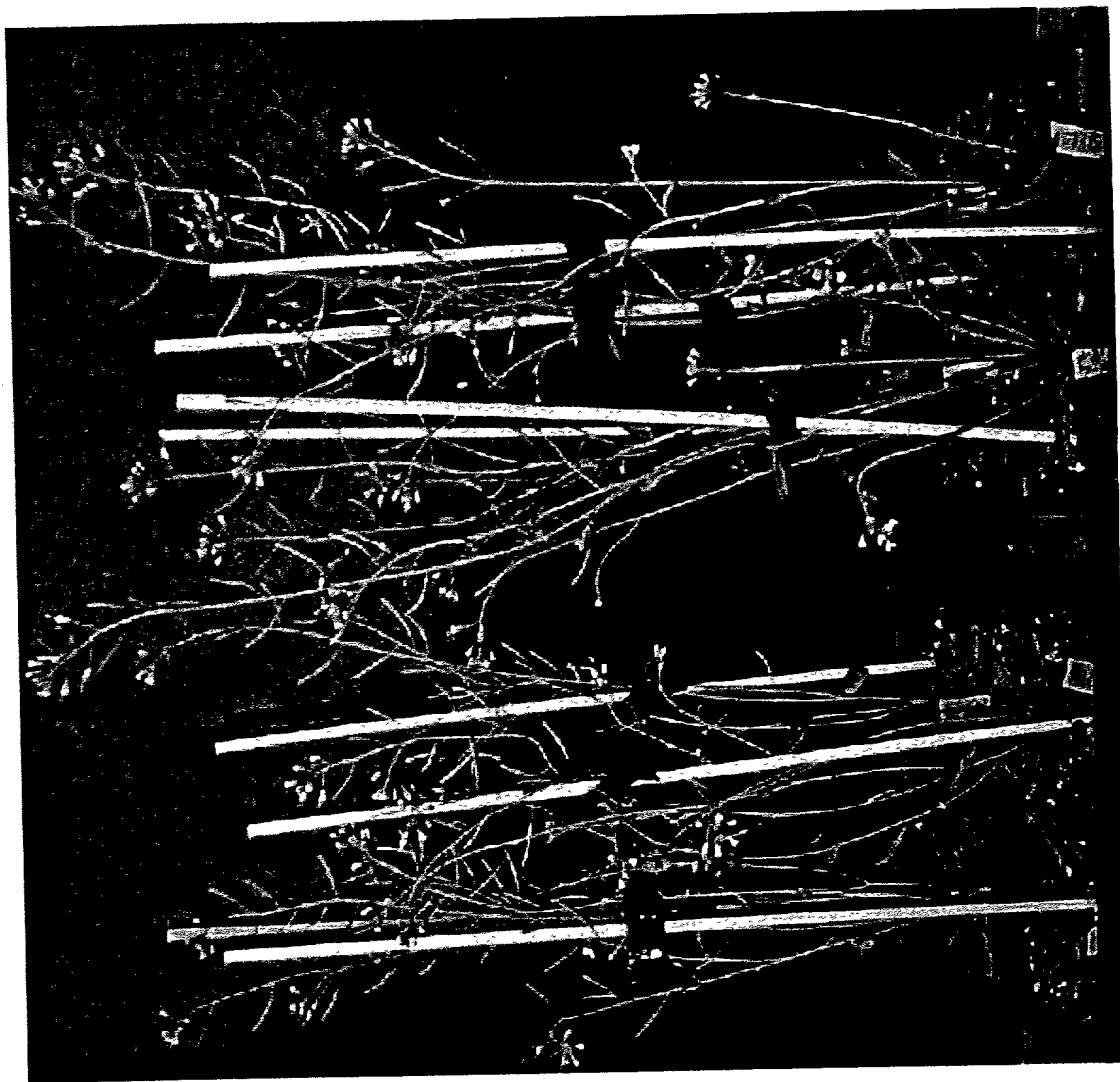


Wild-Type **α - 3'DHS # 7**

Figure 23

006211" 67052460

6.1 Weeks



α - 3'DHS #7

Wild-Type

Figure 24

Seed Volume of Transgenic antisense-3'DHS plants

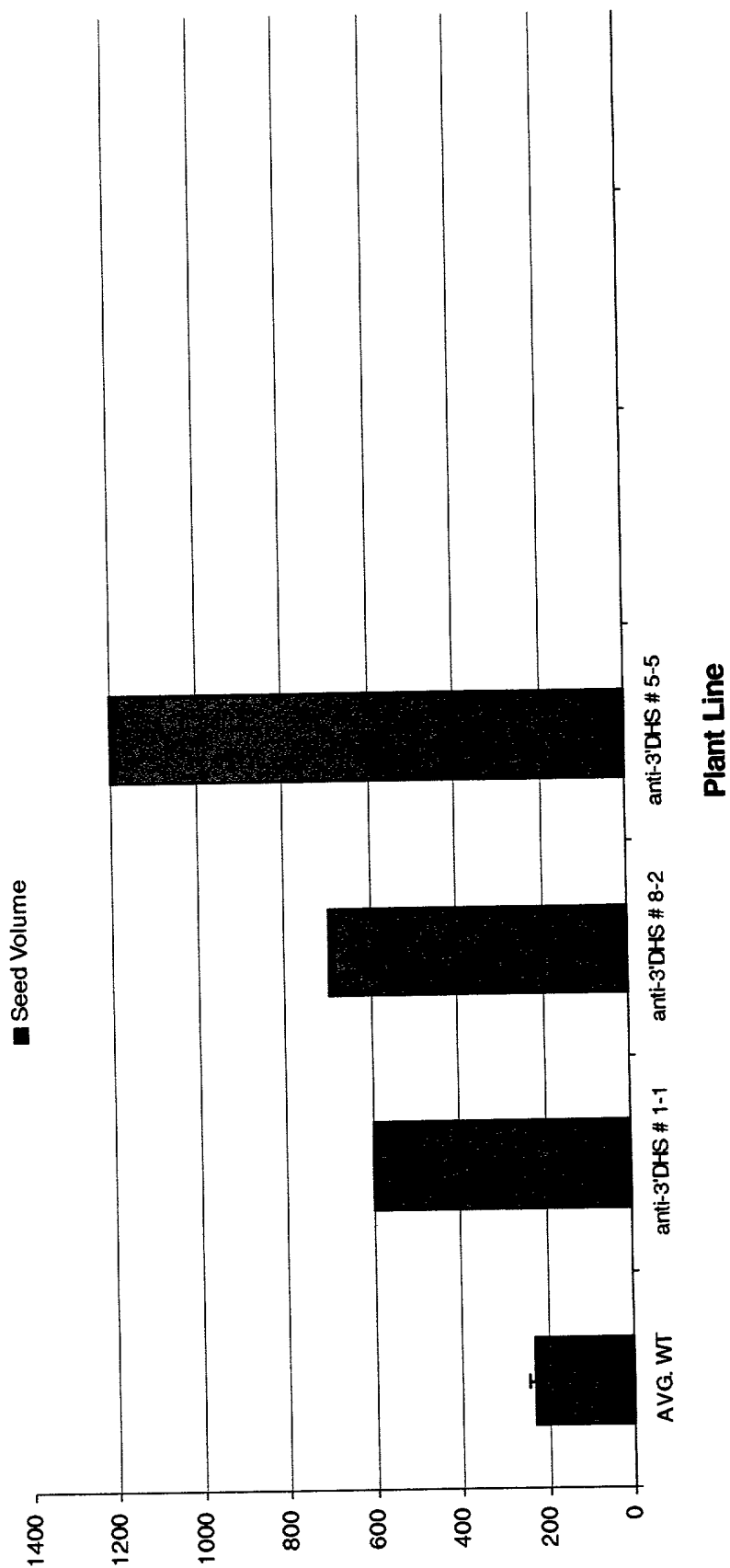


Figure 25

Wild type

Anti 3'-DHS

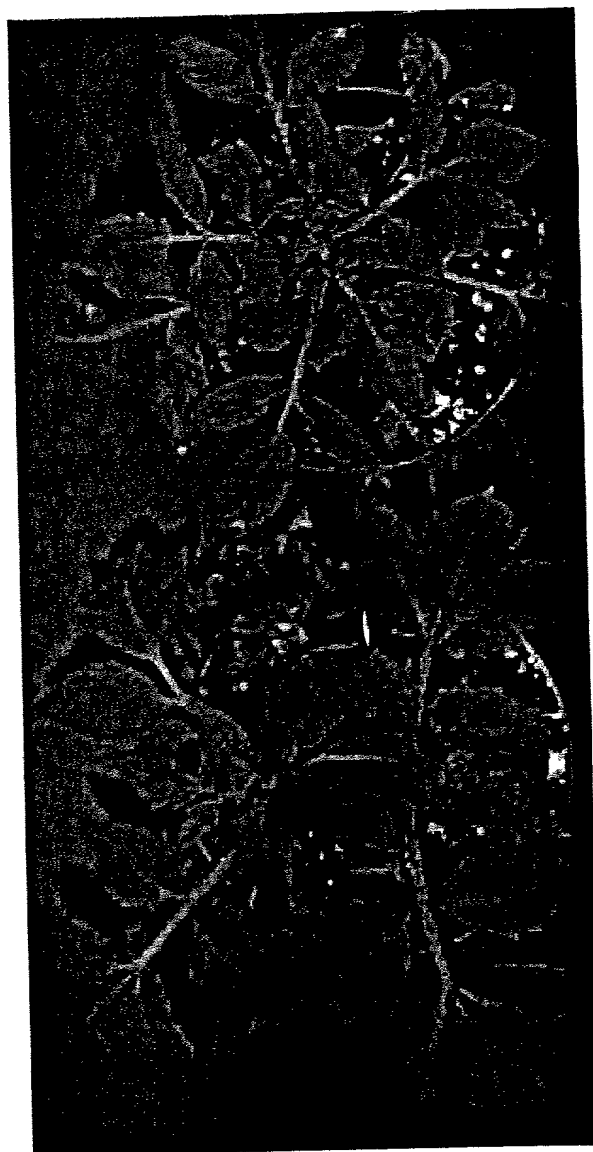


Figure 26

Wild type

Anti 3'-DHS

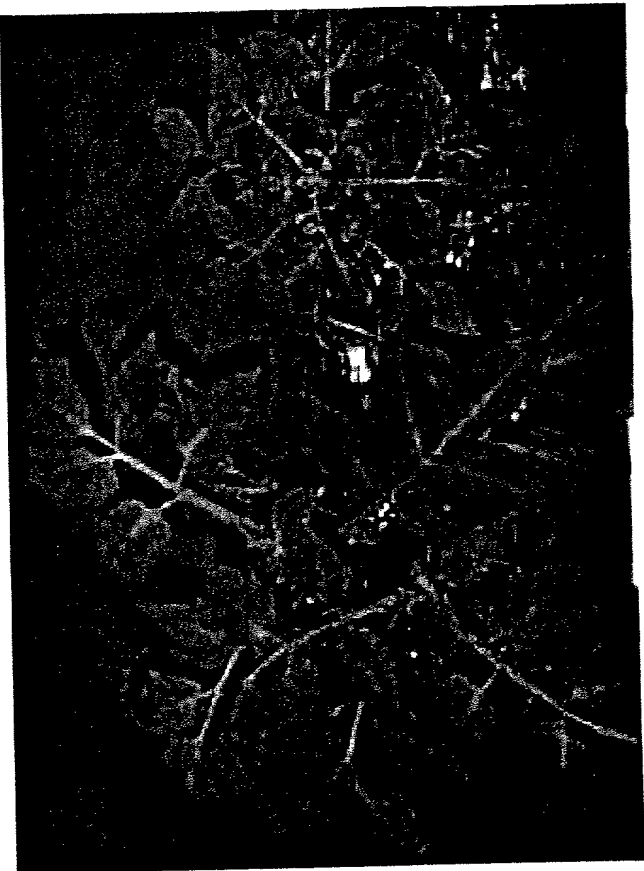
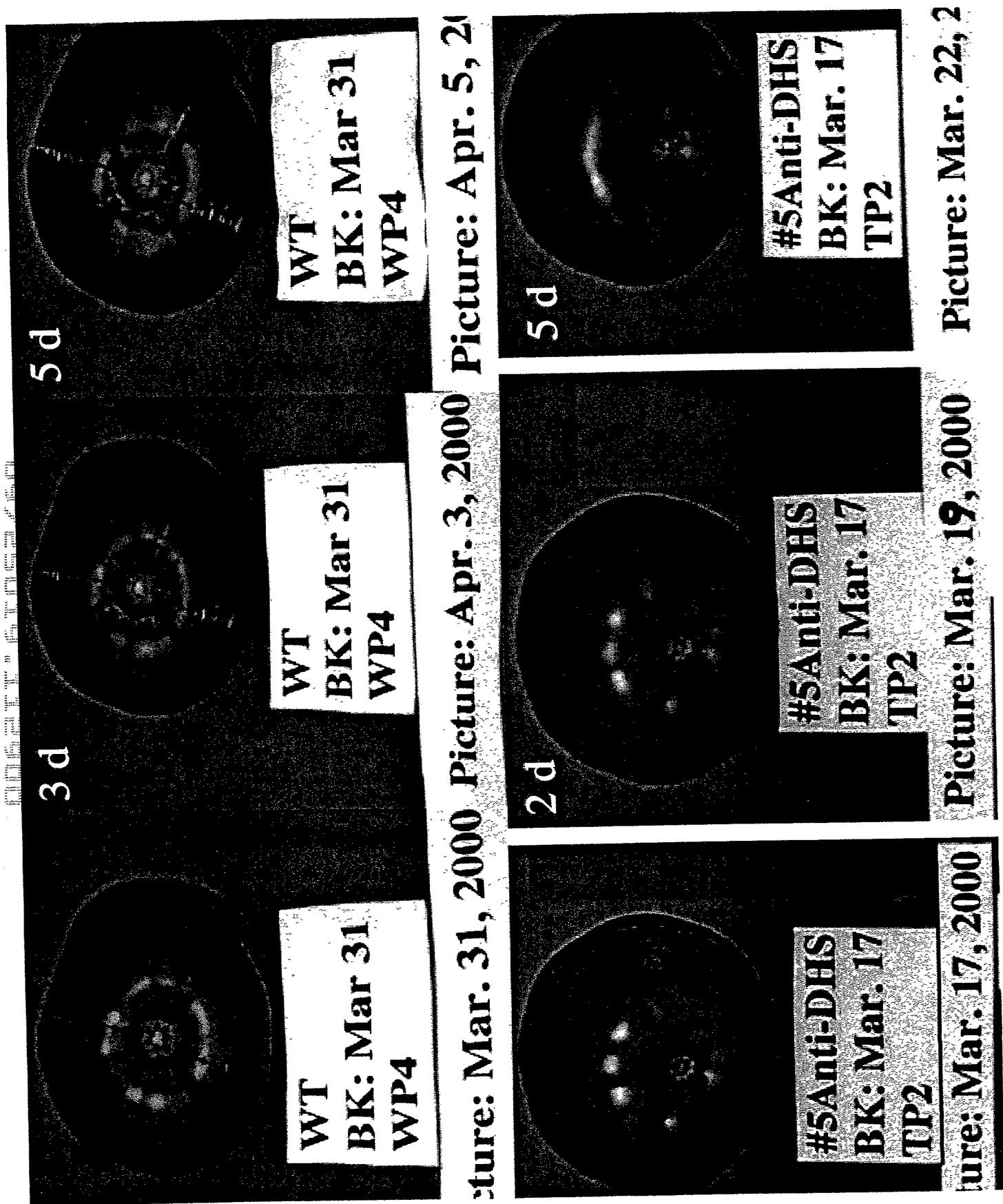


Figure 27

Figure 28



00531T 670524.68

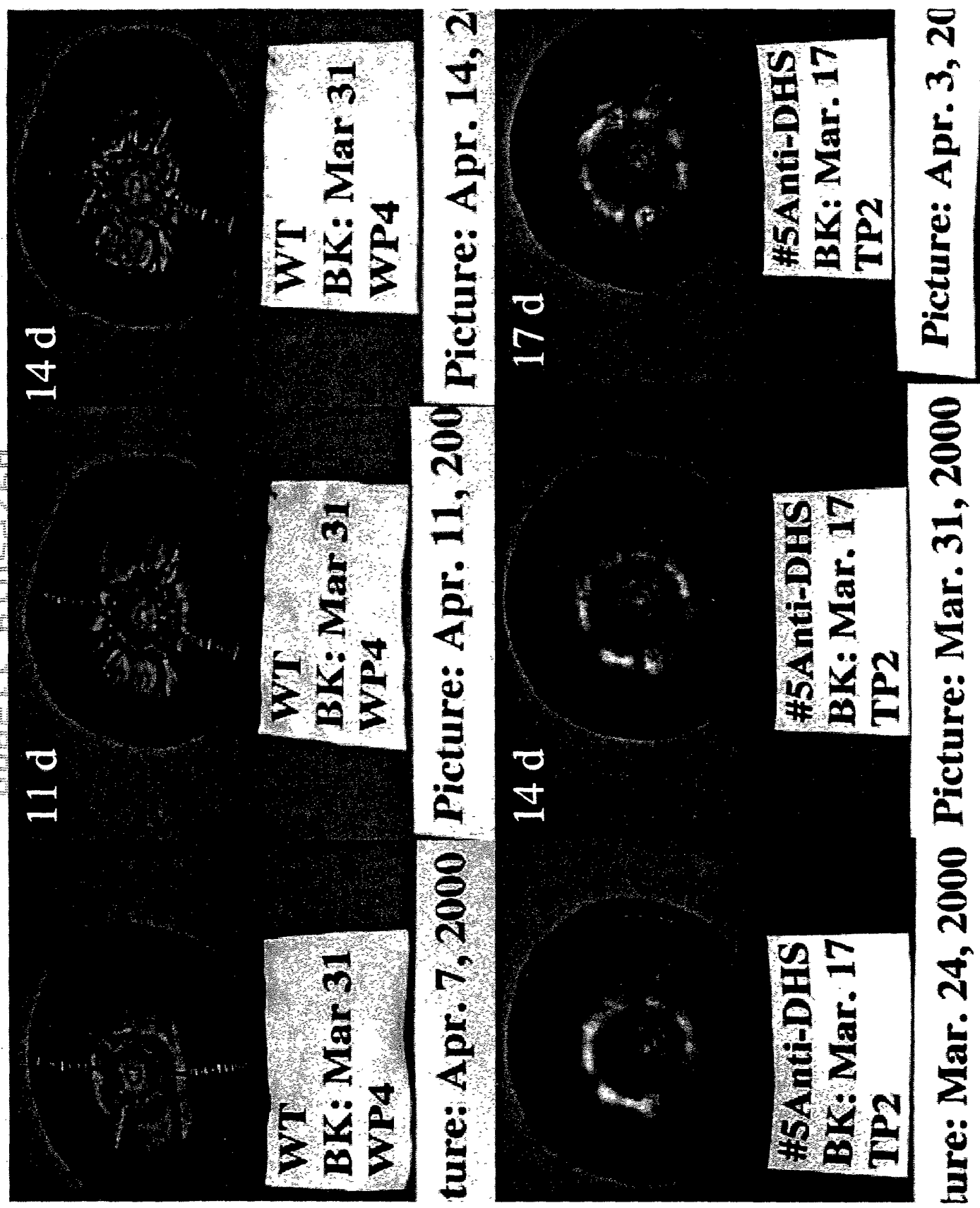
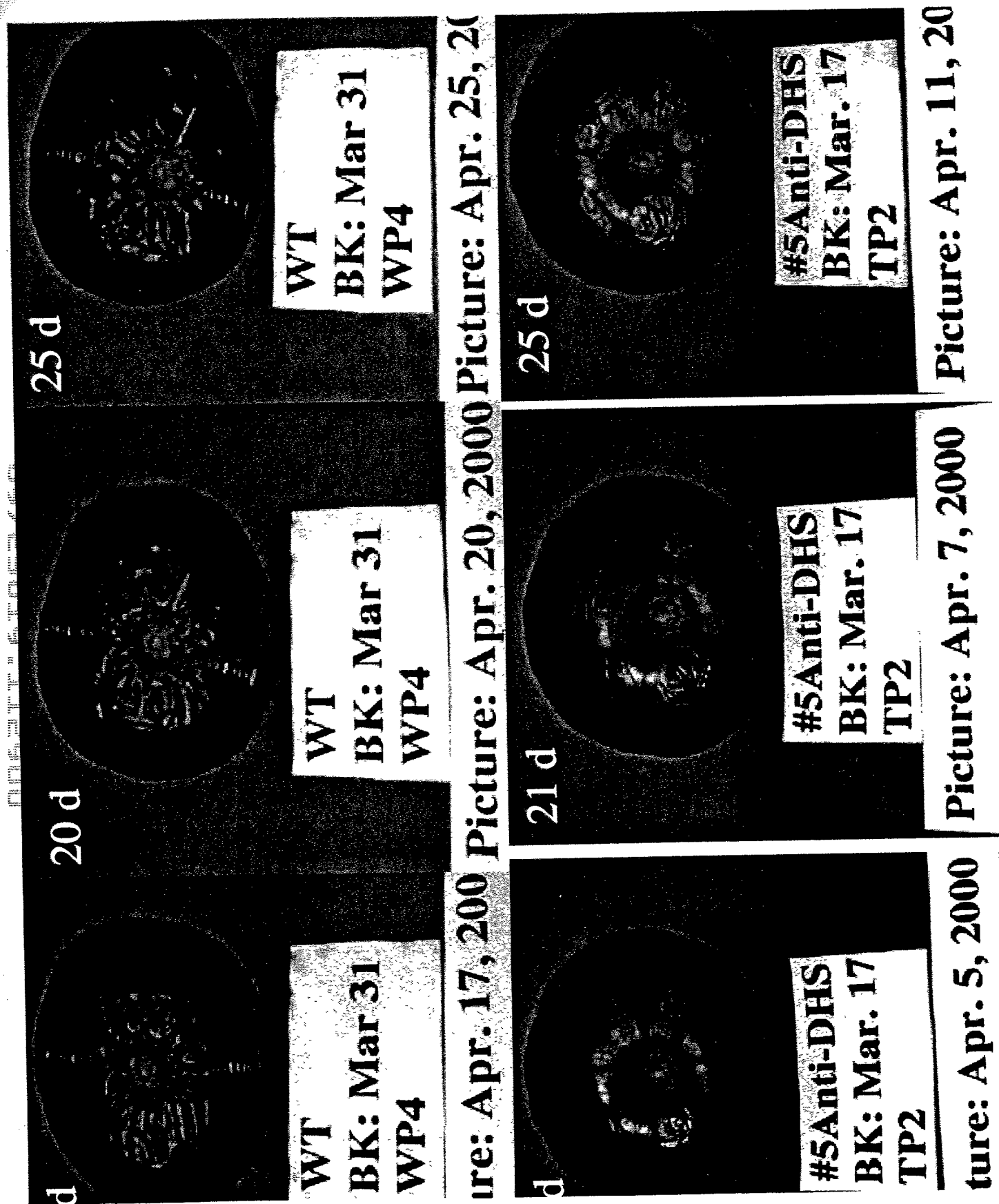


Figure 29

Figure 30



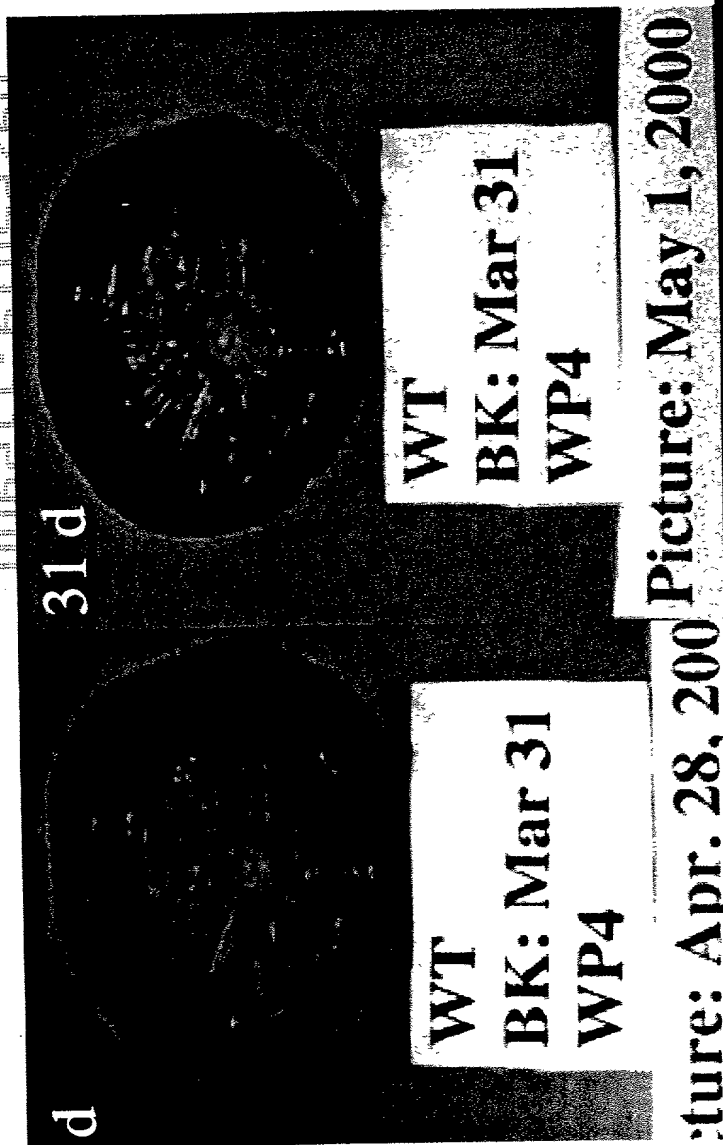


Figure 31

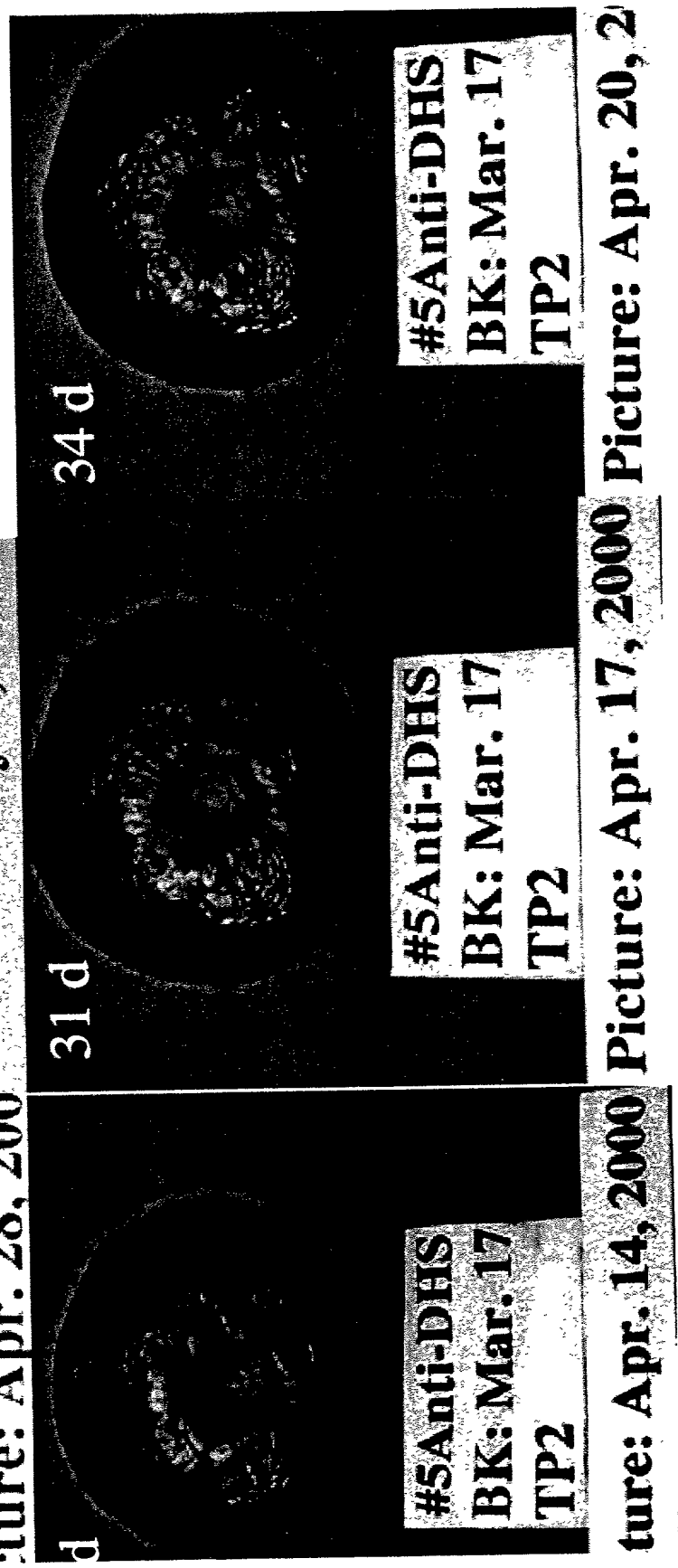
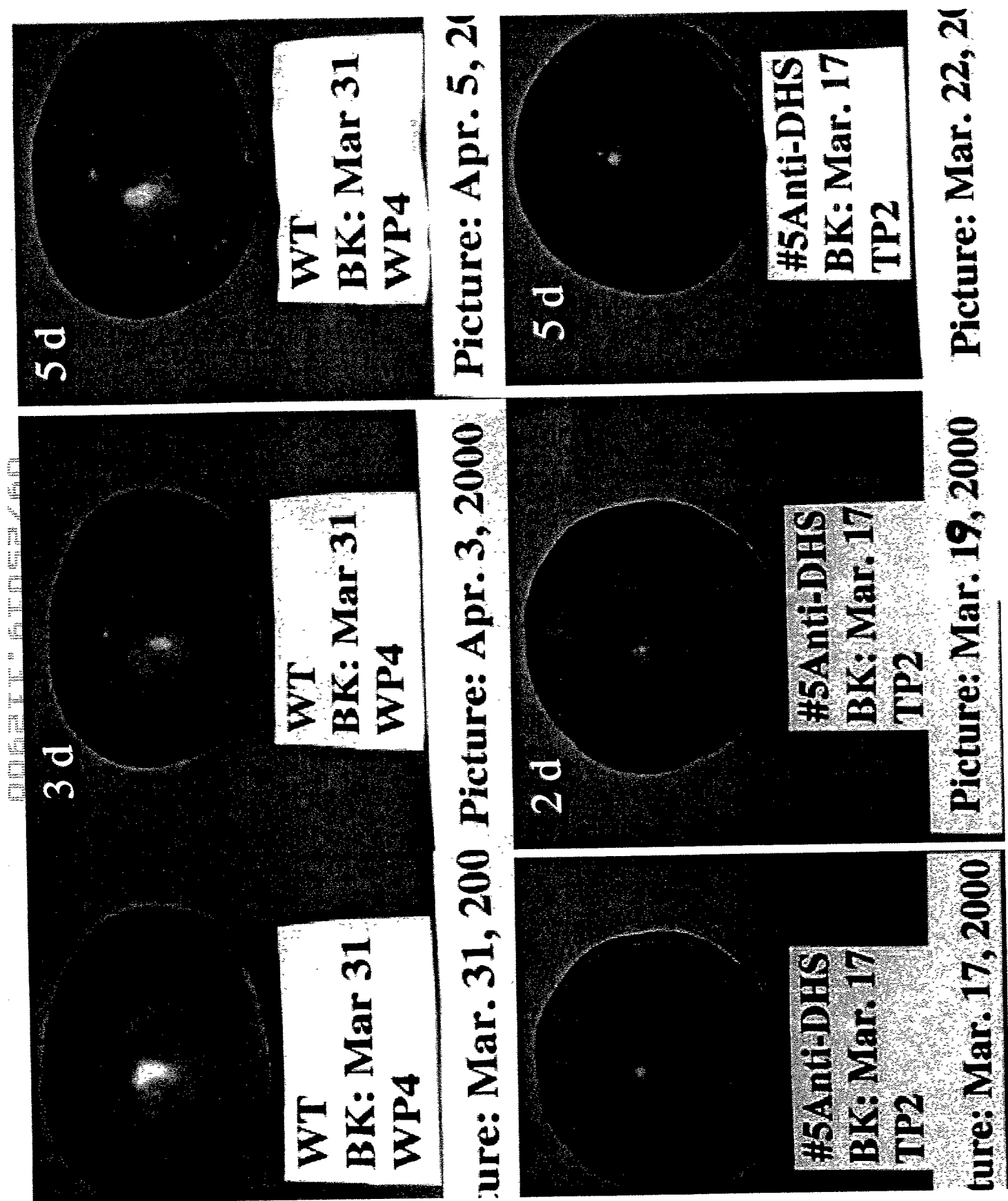
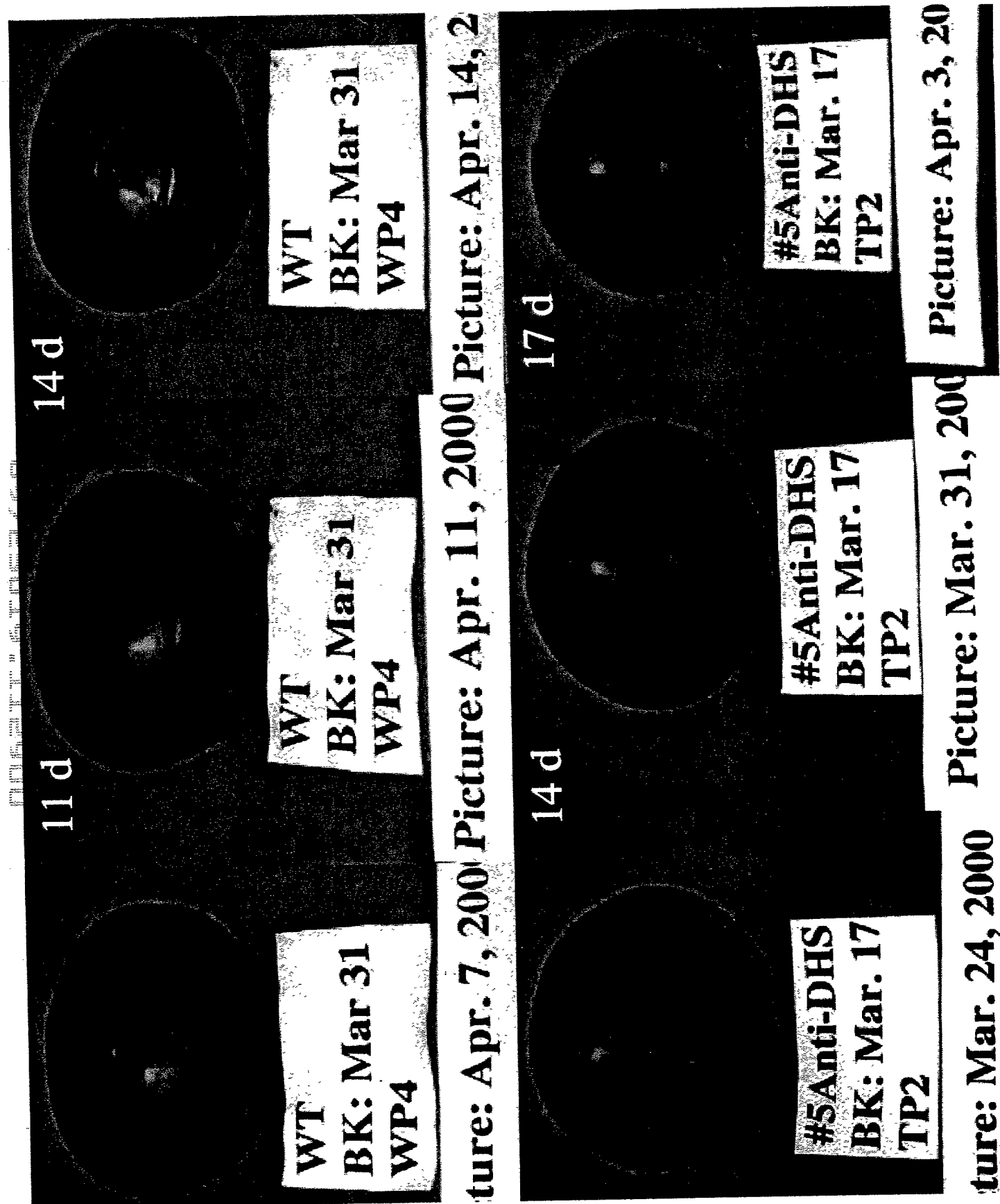


Figure 32





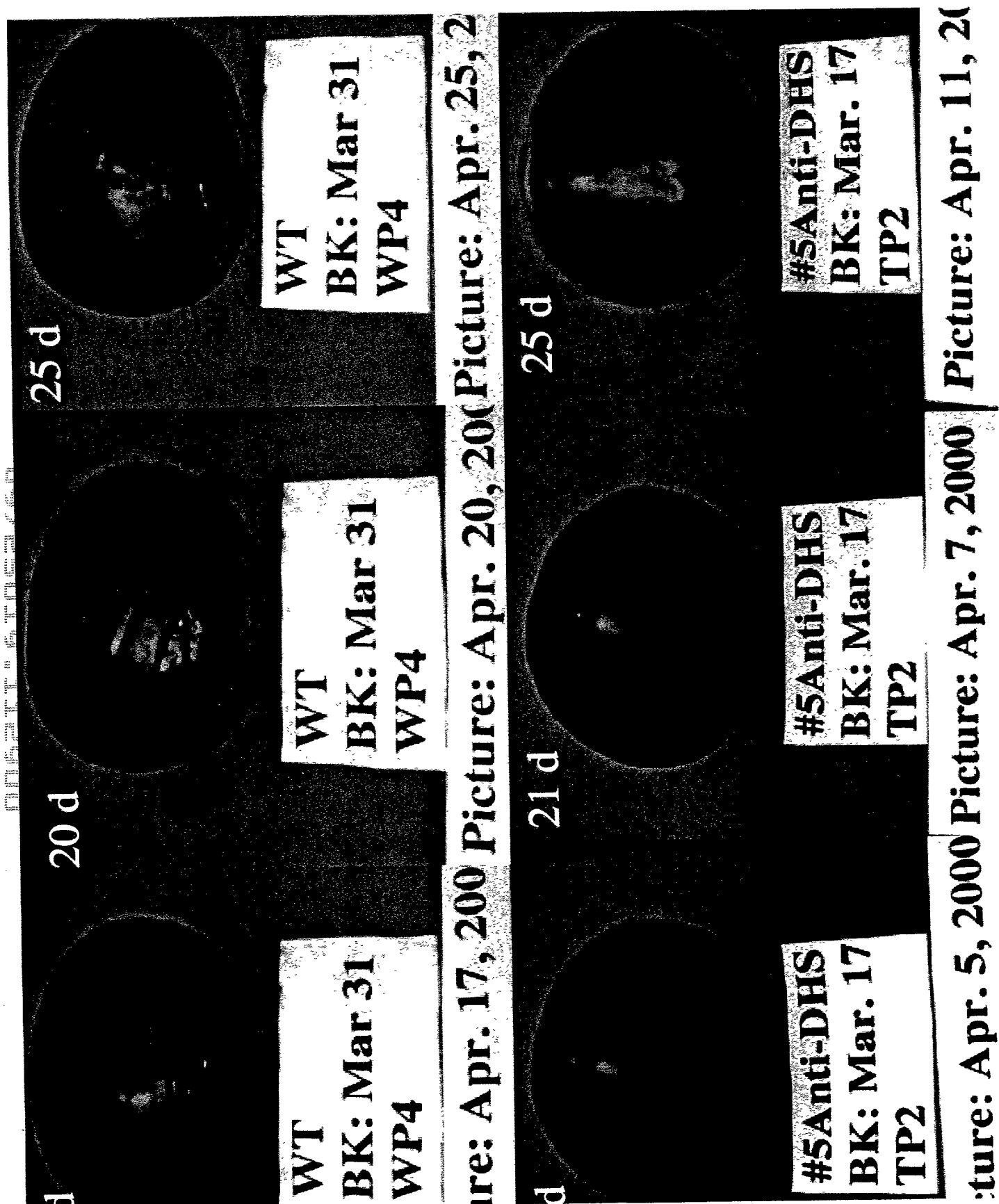


Figure 34

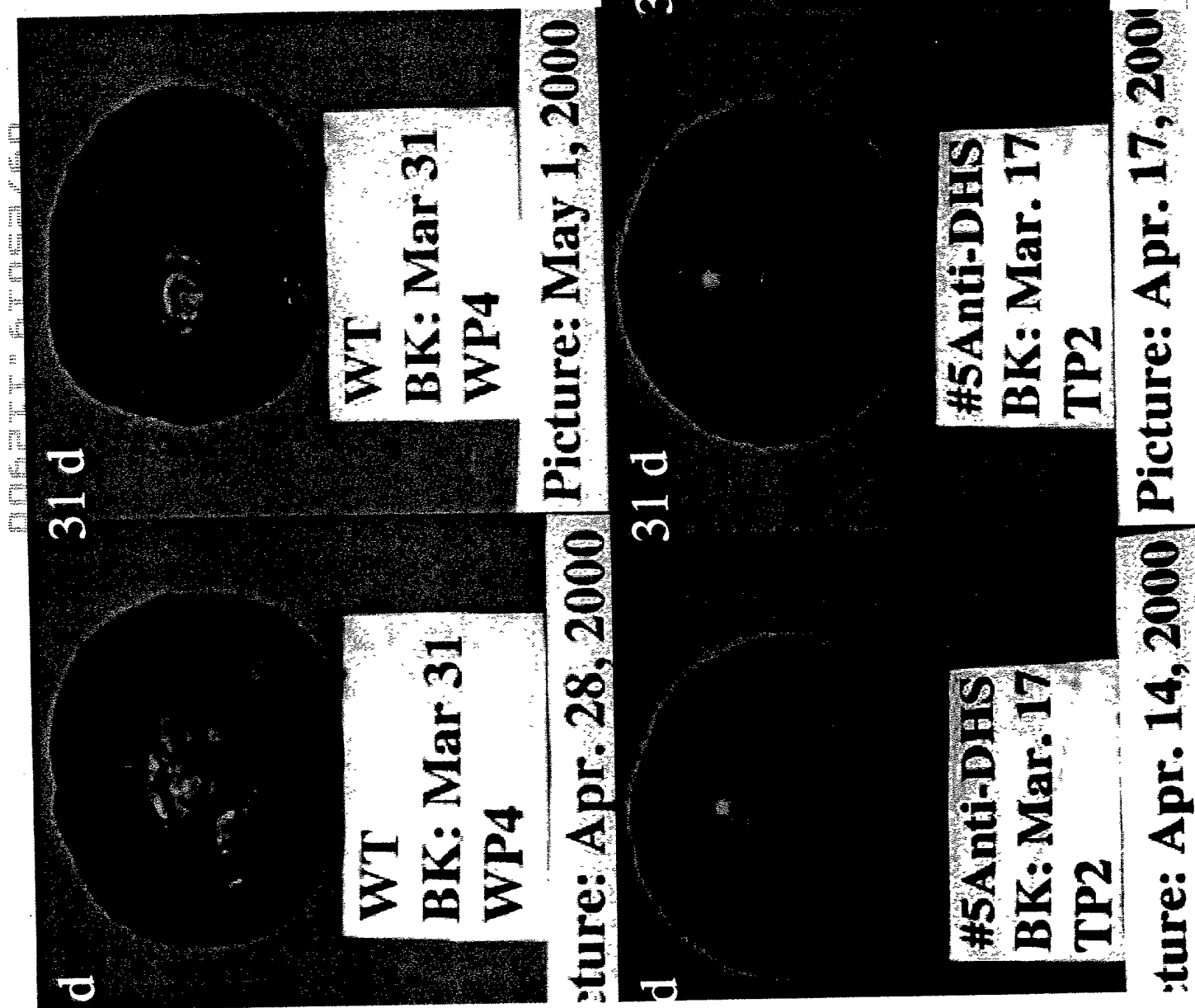


Figure 35

Arabidopsis 3'-end DHS for antisense

Nucleotide and derived amino acid sequence

TGCACGCCCTGATGAAGCTGTGTCTTGGGGTAAAATTAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTT
A R P D E A V S W G K I R G S A K T V K V C F

TAATTTCTTCACATCCTAATTTATATCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTT
L I S S H P N L Y L T Q W F

GCAGGTATACTGTGATGCTACCATAGCCTTCCCATTTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACC
AAACCTGTGAGTCTAAGACTTAAGAACTGACTGGTCGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTT
TGATTTTACACTGGAGTGACCATATAACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGA
ATTGTACTTTAGTTTCTCTCAACCTAAAATGATTTGCAGATTGTGTTTTCGTTTAAACACAAGAGTCTTG
TAGTCAATAATCCTTTGCCTTATAAAATTATTCAGTTCCAACAAAAAAAAAAAAAAAAAAAA

Nucleotide sequence

TGCACGCCCTGATGAAGCTGTGTCTTGGGGTAAAATTAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTT
TAATTTCTTCACATCCTAATTTATATCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTT
GCAGGTATACTGTGATGCTACCATAGCCTTCCCATTTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACC
AAACCTGTGAGTCTAAGACTTAAGAACTGACTGGTCGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTT
TGATTTTACACTGGAGTGACCATATAACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGA
ATTGTACTTTAGTTTCTCTCAACCTAAAATGATTTGCAGATTGTGTTTTCGTTTAAACACAAGAGTCTTG
TAGTCAATAATCCTTTGCCTTATAAAATTATTCAGTTCCAACAAAAAAAAAAAAAAAAAAAA

ARPDEAVSWGKIRGSAKTVKVCFLISSHPNLYLTQWF

Figure 36

Tomato 3'-end-Deoxyhupsine synthase used for antisense

Nucleotide and derived amino acid sequence

GGTGCTCGTCCTGATGAAGCTGTATCATGGGGAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCAAC
G A R P D E A V S W G K I R G G A K T V K V H C D A T

CATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTCTCCCAGATAAGGTGCCAAGTTTGAA
I A F P I L V A E T F A A K S K E F S Q I R C Q V

CATTGAGGAAGCTGTCCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCAACCTGCTAGTGTGCAGCACCATTTA
TTCTGCAAAACTGACTAGAGAGCAGGGTATATTCCTCTACCCCGAGTTAGACGACATCCTGTATGGTTCAAATTAATTAT
TTTTCTCCCTTCACACCATGTTATTTAGTTCTCTTCTCTTCGAAAGTGAAGAGCTTAGATGTTTCATAGGTTTTGAATT
ATGTTGGAGGTTGGTGATAACTGACTAGTCCTCTTACCATATAGATAATGTATCCTTGTACTATGAGATTTTGGGTGTGT
TTGATACCAAGGAAAAATGTTTATTTGGAAAACAATTGGATTTTTAATTTAAAAAAATTGNTTAAAAAAAAAAAAAAAA

Nucleotide sequence

GGTGCTCGTCCTGATGAAGCTGTATCATGGGGAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCAAC
CATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTC

TCCCAGATAAGGTGCCAAGTTTGAACATTGAGGAAGCTGTCCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCA
ACTTGCTAGTGTGCAGCACCATTATTTCTGCAAACTGACTAGAGAGCAGGGTATATTCCTCTACCCCGAGTTAGACGAC
ATCCTGTATGGTTCAAATTAATTATTTTCTCCCTTCACACCATGTTATTTAGTTCTCTTCTCTTCGAAAGTGAAGAG
CTTAGATGTTTCATAGGTTTTGAATTATGTTGGAGGTTGGTGATAACTGACTAGTCCTCTTACCATATAGATAATGTATCC
TTGTACTATGAGATTTTGGGTGTGTTGATACCAAGGAAAAATGTTTATTTGGAAAACAATTGGATTTTTAATTTAAAAA
AAATTGNTTAAAAAAAAAAAAAAAA

Figure 37

600 bp Arabidopsis Deoxyhypusine Synthase Probe

Primer1 (underlined)

GGTGGTGTGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTCTCTCTACCTGGAGC
 TTATTTAAG
 G G V E E D L I K C L A P T F K G D F S L P G A
 Y L R
 GTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCCTAATGATACTACTGCAAGTTTGAGGATTGGA
 TCATTCCCA
 S K G L N R I G N L L V P N D N Y C K F E D W I
 I P
 TCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGAATGTGTTGTGGACTCCTTCTAAACTGTTAGCACGG
 CTGGGAAAA
 I F D E M L K E Q K E E N V L W T P S K L L A R
 L G K
 GAAATCAACAATGAGAGTTCATACCTTTATTGGGCATACAAGATGAATATTCCAGTATTCTGCCCAGGGTT
 AACAGATGG
 E I N N E S S Y L Y W A Y K M N I P V F C P G L
 T D G
 CTCTCTTAGGGATATGCTGTATTTTCACTCTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGATA
 TCAGAGCTA

S L R D M L Y F H S F R T S G L I I D V V Q D I
 R A
 TGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGATAATCCTTGGAGGGGGCTTGCCAAAG
 CACCACATA
 M N G E A V H A N P K K T G M I I L G G G L P K
 H H I
 TGTAATGCCAATATGATGCGCAATGGTGCAGATTACGCTGTATTTATAAACACCGGGCAAGAATTTGATGG
 GAGCGACTC
 C N A N M M R N G A D Y A V F I N T G Q E F D G
 S D S

GGGTGCACGCCCTGATGAAGC

G A R P D E

Primer 2 (underlined)

483 bp Carnation Deoxyhypusine Synthase Probe

GAAGATCCATCAAGTGCCTTGCACCCACTTTCAAAGGCGATTTTGCCTTACCAGGAGCTCAATTACGCTCC
 AAAGGGT
 R R S I K C L A P T F K G D F A L P G A Q L R S
 K G

TGAATCGAATTGGTAATCTGTTGGTCCGAATGATAACTACTGTAAATTTGAGGATTGGATCATTCCAATT
 TTAGATA
 L N R I G N L L V P N D N Y C K F E D W I I P I
 L D

AGATGTTGGAAGAGCAAATTTCAAGAGAAAATCTTATGGACACCATCGAAGTTGATTGGTCGATTAGGAAGA
 GAAATAA
 K M L E E Q I S E K I L W T P S K L I G R L G R
 E I

ACGATGAGAGTTCATACCTTTACTGGGCCTTCAAGAACAATATTCCAGTATTTTGCCAGGTTTAACAGAC
 GGCTCAC
 N D E S S Y L Y W A F K N N I P V F C P G L T D
 G S

TCGGAGACATGCTATATTTTCATTCTTTTCGCAATCCGGGTTTAATCATCGATGTTGTGCAAGATATAAGA
 GCAGTAA

L G D M L Y F H S F R N P G L I I D V V Q D I R
 A V

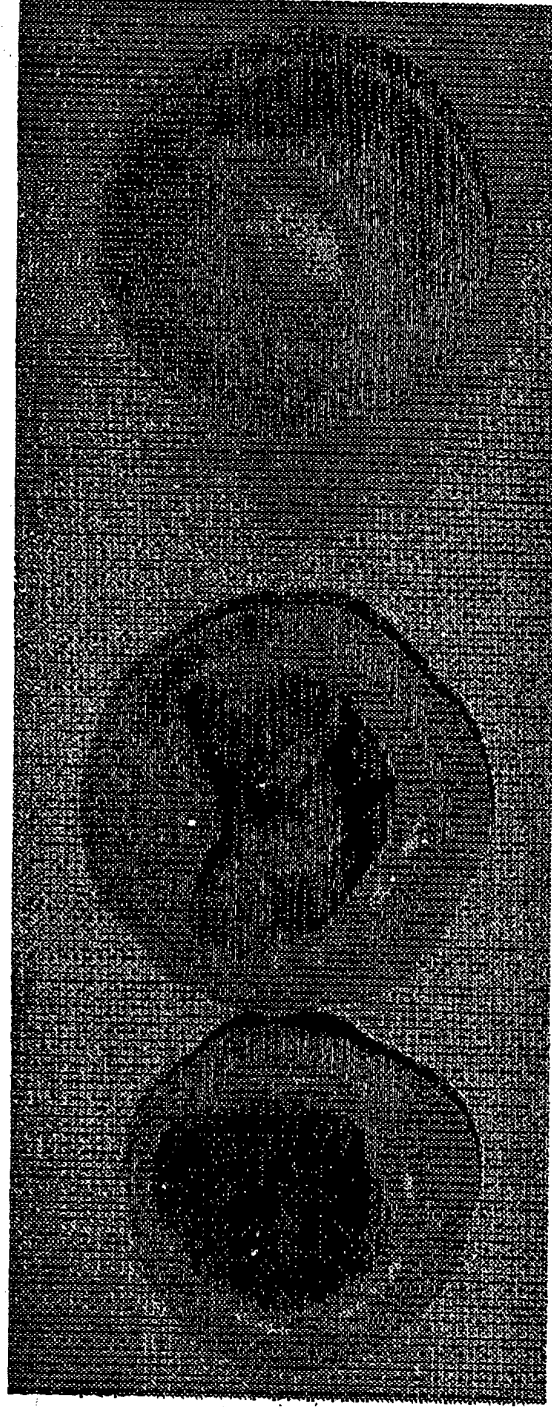
ATGGCGAGGCTGTGCACGCAGCGCCTAGGAAAACAGGCATGATTATACTCGGTGGAGGGTTGCCTAAGCAC
 CACATCT
 N G E A V H A A P R K T G M I I L G G G L P K H
 H I

GCAACGCAAACATGATGAGAAATGGCGCCGATTATGCTGTTTTTCATCAACACCG
 C N A N M M R N G A D Y A V F I N T

A full-length cDNA clone was obtained by screening a carnation senescing petal cDNA library with this probe.

Figure 39

Figure
40A



Blossom end rot

Normal

Figure
40 B

